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## SPECIAL ARTICLES

## GERMINATING FRESHLY HARVESTED WINTER WHEAT

FREQUENTLY only a small percentage of freshly harvested winter wheat germinates readily under the conditions ordinarily used in making the germination tests even though it would germinate well under these same conditions a few weeks later. In sections of the country where farmers depend upon wheat from the current crop for the fall sowing the poor germination secured with the fresh grain has made it difficult for seed analysts to give accurate information as to the quality of winter wheat offered for seed in time for this information to be of service.

In a recent investigation by the Seed Testing Laboratories of the United States Department of Agriculture it has been found that the difficulty described in the preceding paragraph can be almost entirely overcome even with wheat taken from standing plants and never allowed to dry out by the use of a lower temperature than has been customary for making the germination tests. Thus of 16 samples of freshly harvested wheat an average of 99 per cent. began to germinate in 5 days at temperatures from 9° to 16° C. (48° to 61° F.), whereas in the same time an average of only 86 per cent. germinated at 22° C. (72° F.) which is about the temperature at which germination tests of wheat are frequently made. In the case of one lot 98 per cent. were germinating by the end of 5 days at 12° C. (54° F.) and only 16 per cent. at 22° C. (72° F.). About 15° C. (59° F.) is recommended for use in making germination tests of all freshly harvested wheat. Of course at this temperature the rate of growth is slow after germination has begun. However, if one wishes to assure himself of the normal character of the seedlings it is only necessary to transfer the wheat grains as soon as the coverings are split over the embryo to some place where the temperature is about 20° C. (68° F.) and leave them at the higher temperature for a day or two.

A number of other methods have been dis-

covered of overcoming this difficulty, at least partly, but none is as satisfactory as the use of a low germination temperature. Removing the coats over the embryo by the use of concentration sulphuric acid, followed by neutralization of the acid and washing, and a number of mechanical treatments which consist essentially of exposing the embryo to external conditions have been markedly successful, but are all tedious and some of them are attended with great danger of subsequent decay of the grain.

Drying the wheat at about 40° C. (105° F.) for a week had a somewhat beneficial effect upon its germination, but this method of treatment does not give wholly satisfactory results and, together with the following germination test, consumes more time than can be allowed, especially toward the end of the fall sowing season.

All of the methods which were beneficial with winter wheat gave equally good results with spring wheat and all except treatment with sulphuric acid were used with more or less success also in the germination of freshly harvested barley and oats, with which the same difficulty may be experienced as with wheat.

A full report of the investigation is to be published shortly by the United States Department of Agriculture.

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